STREAM AND BIRD SURVEYS
BASELINE INVESTIGATION
GATEWAY PACIFIC TERMINAL
WHATCOM COUNTY, WASHINGTON

Submitted to:
Pacific International Terminals
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Seattle, Washington 98134

Submitted by:

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AMEC Project No. 8-915-15338-B

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1.0 INTRODUCTION

1.1 Purpose and Need

AMEC Earth & Environmental, Inc. (AMEC) conducted an aquatic fish and wildlife baseline investigation at the request of Pacific International Terminals, Inc. (PIT) on portions of 1,092 acres of heavy-impact industrial zoned land in the vicinity of Cherry Point in Whatcom County, Washington. Baseline investigations include an inventory of fish presence and habitat in one potential fish bearing stream, as well as visual and auditory bird surveys. The fish and wildlife investigation presented herein will function as an environmental baseline for evaluating potential effects of site development on fish and wildlife within the project vicinity. The results of this investigation may also be used to identify habitat enhancement and restoration opportunities.

1.2 Description of Study Area

The study area is located 18 miles northwest of Bellingham and 10 miles west of Ferndale (Figure 1). The study area covers portions of Sections 17, 18, and 19 of Township 39 North, Range 1 East, all in unincorporated Whatcom County (Figure 2). The study area is accessible from I-5 via Highway 548 (Grandview Road) west, and south on Kickerville Road.

1.2.1 Environmental Setting

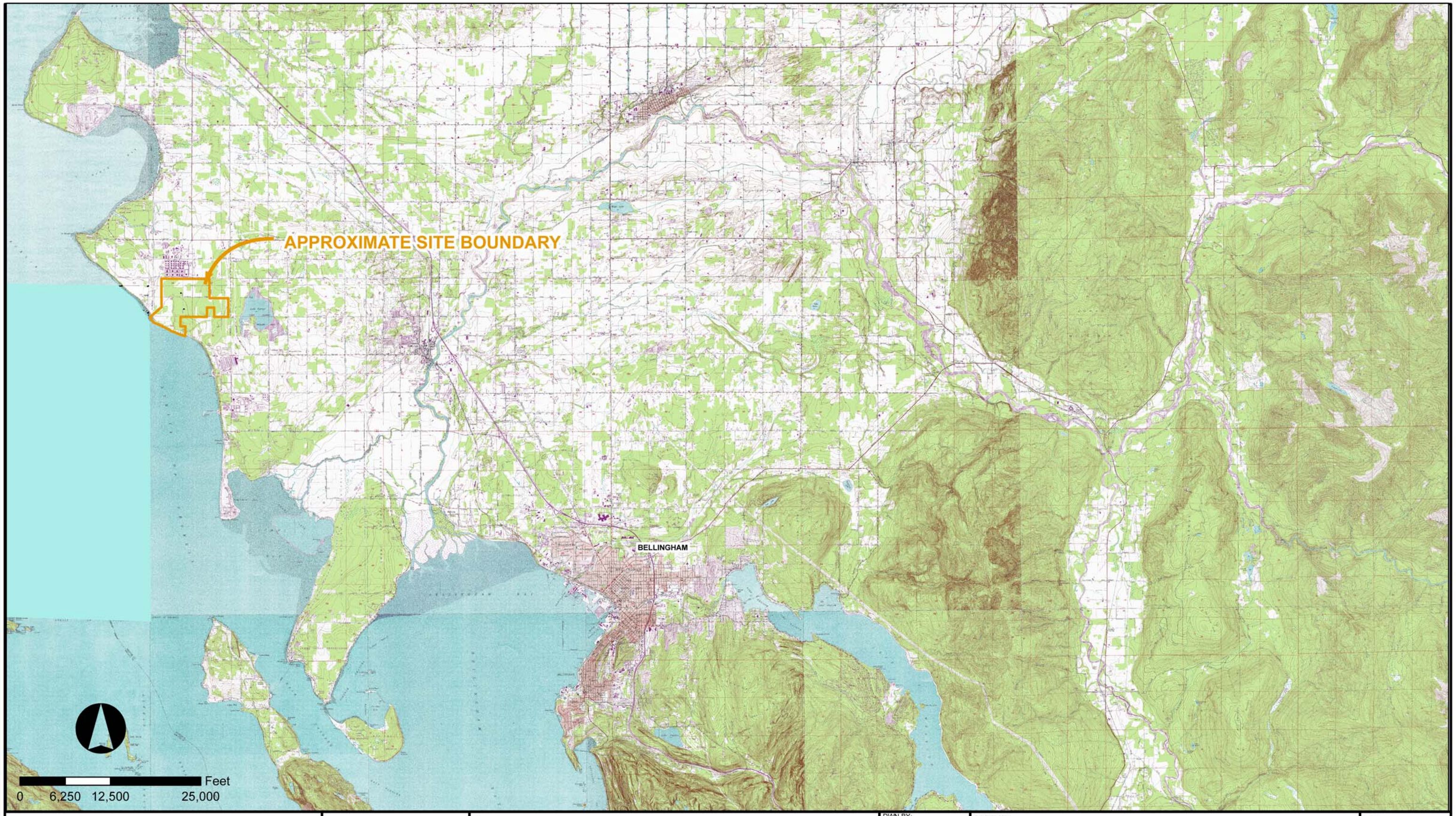
Roughly rectangular in shape, the study area is bound by roads and industrial operations to the north, east, and south, and by the Strait of Georgia to the southwest:

- BP's Cherry Point refinery property is adjacent to the north and west;
- 70 acres owned by BP lie to the northwest;
- Kickerville Road, populated by private residences on approximately 5 acre plats lies to the east; and
- pastures and a small industrial area lie to the south.

Cherry Point, a small promontory of land south of Point Whitehorn, forms the southwest corner of the study area. Roads, pipelines, power line corridors, railroads, and other heavy industrial utilities further define the study area. Gulf Road (formerly Powder Plant Road) and a BNSF railway line run north-south in the eastern portion of the site, and Lonseth Road bisects the study area east-west. A BPA transmission-line corridor runs north-south through the eastern study area. An area measuring approximately 28 acres

between Henry Road and Lonseth Road, west of the BNSF railway line is under separate ownership and was excluded from the study area.

The study area is situated within the Urban Growth Area (UGA) of unincorporated Whatcom County (UGA-9), and is zoned for heavy industrial/port growth (Whatcom County, 2006).



CLIENT: PACIFIC INTERNATIONAL TERMINALS

AMEC Earth & Environmental
7376 SW Durham Road
Portland, OR, U.S.A. 97224

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PROJECT: GATEWAY PACIFIC TERMINAL
STREAM AND BIRD SURVEYS
BASELINE INVESTIGATION

TITLE: VICINITY MAP

DATE: SEPTEMBER 2009
PROJECT NO.: 5-91M-15338-0
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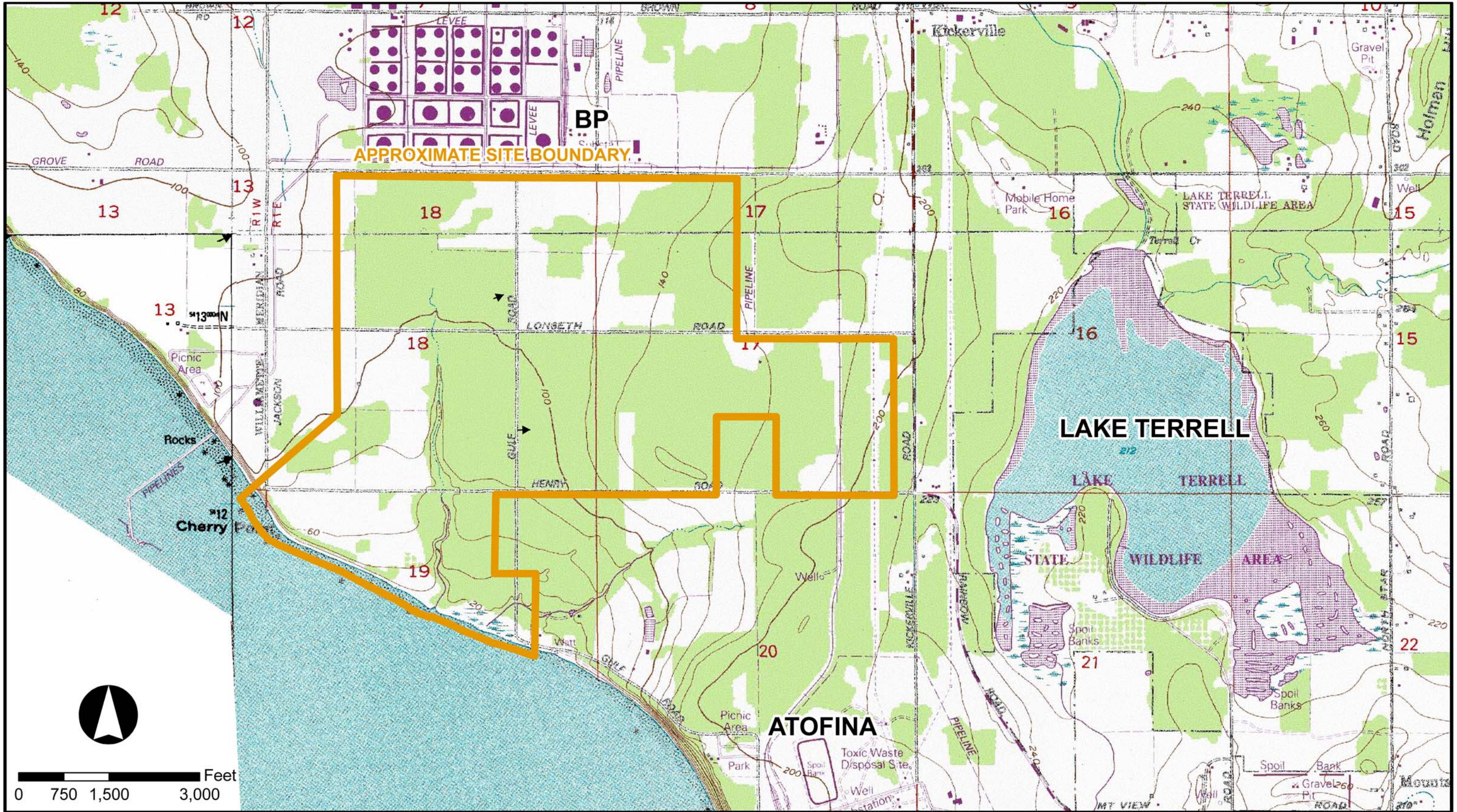

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		AMEC Earth & Environmental 7376 SW Durham Road Portland, OR, U.S.A. 97224		TITLE: STUDY AREA	

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2.0 FISH SURVEYS

A fish inventory and stream habitat investigation was conducted to identify fish use and to assess potential salmonid spawning and rearing habitat within the study area. Habitat was evaluated according to: general riparian condition, a survey of large woody debris (LWD), and an evaluation of human activities in the local watershed. The purpose of this study is to identify the baseline condition of potentially fish bearing streams onsite in order evaluate the potential effects of the project on baseline conditions, and to identify opportunities for stream restoration as potential mitigation.

STREAMS AND DRAINAGES

Seven streams have been identified within the study area (AMEC 2008). Streams in the study area include five roadside ditches (Streams 3 through 7) and two natural watercourses (Figure 3). The majority of the study area drains to one stream (Stream 1), which is identified as stream number .01.0100 by the Water Resources Inventory Area (WRIA) 1. Stream 1 is the only documented fish bearing stream in the Study Area (Shapiro 2004) and is therefore, the focus of this investigation.

Stream 1 is approximately 1.25-miles long (USGS NHD database), with its headwaters in the northeast portion of the study area. The stream drains a total of approximately 800 acres, approximately 90 percent of which is contained within the study area. It is fed by surface flow through excavated roadside ditches, isolated channels within wetlands, groundwater seeps, and in some places, by surface sheet flow.

According to the WDFW classification system, Stream 1 would be likely classified as a Type III stream, although no official stream rating exists. Whatcom County categorizes Stream 1 as a HCA-1b stream (AMEC 2008). See below for Stream Types and Descriptions for Washington State and Whatcom County.

Table 1 Washington State Steam Types and Descriptions

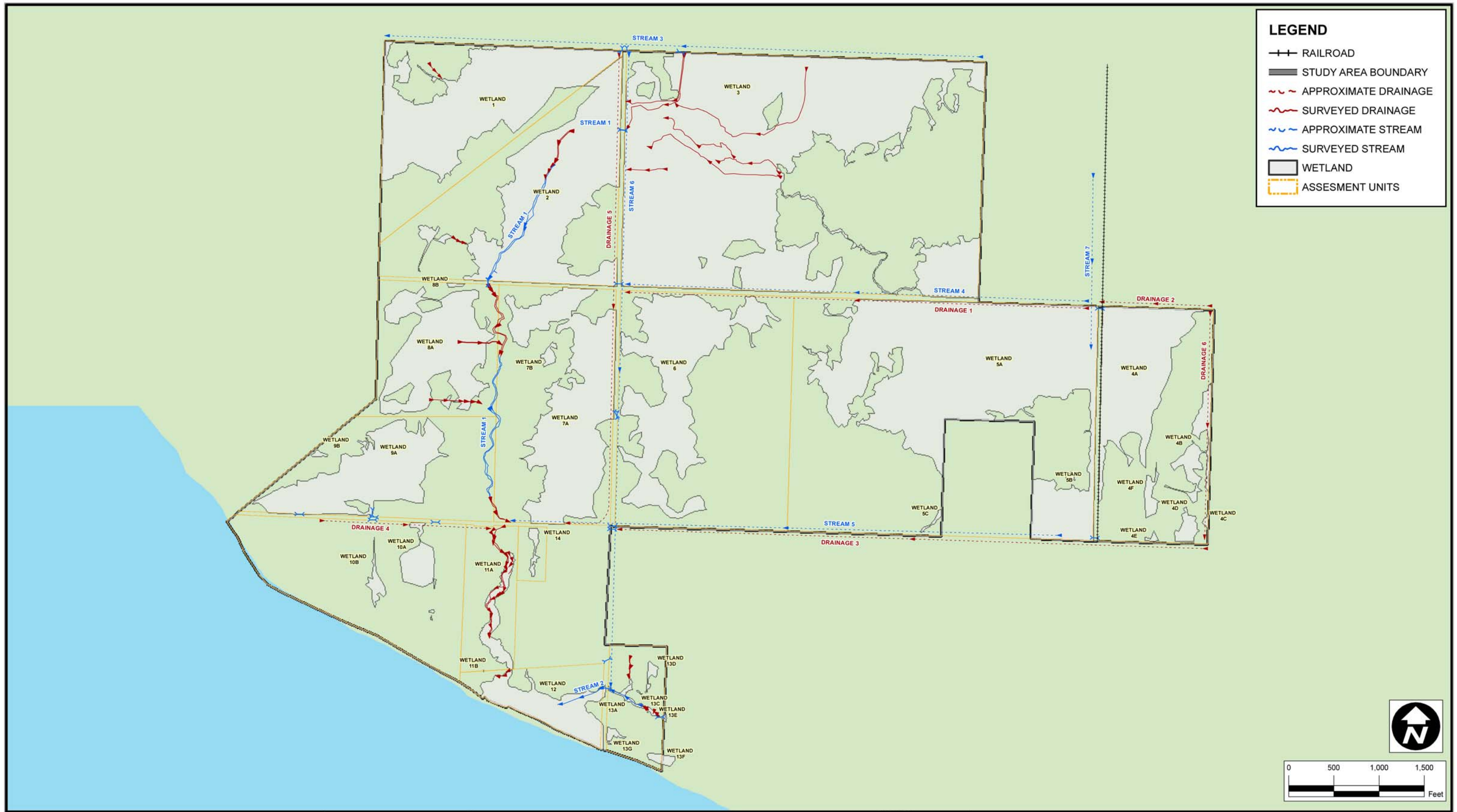
Type	Description
Type I	All water areas of the state including reservoirs and associated shorelands and lands underlying them, waters designated Shorelines of the State specified as shorelines of statewide significance (90.58.030), shorelines of streams where the mean annual slow is 20 cfs or less, and shorelines on lakes less than 20 acres.
Type II	Streams with a defined channel 20 feet or greater in width between ordinary high water marks, and a gradient less than 4 percent, used by substantial numbers of anadromous or resident game fish for spawning, migration or rearing or; contain off channel habitat for salmonids or; connected to a stream bearing salmonids, and accessible during some period of the year, and the off-channel water must be accessible to juvenile salmonids through a drainage with less than a 5% gradient.
Type III	Streams with a moderate to slight fish, wildlife, and human use. They are natural waters that are periodically inundated and provide significant numbers of anadromous or resident game fish with habitat for spawning,

	rearing, or migration. This includes a defined channel of 2 feet or greater in width between the ordinary high-water marks, and a gradient of 16 percent or less. These parameters do not apply if the waters have confirmed, long term, naturally occurring water quality parameters incapable of supporting anadromous or resident game fish.
Type IV	Perennial or intermittent natural waters that are less than 2 feet in width between ordinary high-water marks.
Type V	Streams with or without well-defined channels, areas of perennial or intermittent seepage, ponds, natural sinks, and drainageways having short periods of spring or storm runoff.

Source: WAC 222-16-030

Table 3. Whatcom County Stream Types and Descriptions

Type	Description
HCA 1a	Shorelines of the state as defined by WAC 173-18-310 and designated in the Whatcom County Shoreline Master Programs (WCC Title 23).
HCA 1b	Other fish bearing streams that do not meet the definition of shorelines of the state but have known or potential use by anadromous or resident fish species.
HCA 1c	Non-fish bearing streams are those streams that have no known or potential use by anadromous or resident fish.



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			DATUM: NAD83	TITLE: STREAMS AND DRAINAGES IN THE STUDY AREA	REV. NO.: X	
		AMEC Earth & Environmental 7376 SW Durham Road Portland, OR, U.S.A. 97224	PROJECTION: WA SP North, Ft.		FIGURE NO.: FIGURE 3	
			SCALE: 1 inch equals 1,000 feet			

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2.1 Methods

Protocols and methodologies for assessing stream habitat in the Pacific Northwest have been developed by many Federal, State and Local agencies. Recently, King County conducted a habitat assessment of the main-stem of Juanita Creek that incorporated a variety of methods used by the agencies (King County 2000). Additionally, the U.S. Environmental Protection Agency (EPA) uses physical habitat assessment methods as a standard for collecting stream habitat data in its Environmental Monitoring and Assessment Program (EMAP). The methods used in the present habitat assessment of Stream 1 were modeled after a combination of the Juanita Creek study methods and the EPA's EMAP methods (Kaufmann et al. 1999).

2.1.1 Field Methods

For the purpose of analysis, the 1.25-mile Stream 1 was subdivided into three reaches (Table 2). Stream reaches were defined by fish passage barriers at the two culverted road crossings in the study area. The three reaches range in length from 700 to 2,800 feet. Cross sections were established in each reach to investigate riparian condition, human influence, habitat value and other parameters that will be described later in this text. Cross sections were established at systematically spaced intervals, approximately 300-feet apart, along the length of each reach (Table 2, Figure 4).

Table 2 Stream 1 Reach Descriptions

Reach Number	Description	Length (ft)	Number of Cross Sections
1	Stream mouth to Henry Road	2,161	7
2	Henry Road to Lonseth Road	2,742	9
3	Upstream of Lonseth Road	761	2

Cross Section Characterization

Stream characteristics were evaluated using a variety of techniques at cross sections along each reach. Riparian condition and canopy cover, large woody debris (LWD) abundance, bankfull width and depth, and human impacts including land use data were collected at each cross section. Photographs were also taken at each cross section to record the upstream, bank left, downstream, and bank right view.

Riparian Condition

Visual estimation was used to characterize the type and percent cover of riparian vegetation. This method, used to evaluate the condition and level of disturbance of the stream corridor, is based on the EMAP method. Following the EMAP field methods, the riparian vegetation was divided into three layers: a canopy layer (> 5 m high), an understory (0.5 to 5 m high), and a ground cover layer (< 0.5 m high). Dominant riparian vegetation was described for the right and left banks using the following categories:

LEGEND

- STUDY AREA BOUNDARY
- REACH 1
- REACH 2
- REACH 3

REACH 3
761 ft

REACH 2
2742 ft

REACH 1
2161 ft

171100020203 Washington

0 1,000 2,000 3,000 Feet

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		AMEC Earth & Environmental 11810 North Creek Parkway N Bothell, WA 98011		TITLE: STREAM INVESTIGATION AREA	

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- Forest (greater than 6 m in height): coniferous, deciduous, or mixed
- Shrubs and/or vines
- Tall herbaceous (e.g., unmowed field)
- Short herbaceous (e.g., mowed grass, pasture)
- Impervious (e.g., buildings, roads, asphalt, etc.)
- Residential landscaped (mowed lawn with ornamental shrubs/trees)

It is important to note that in the forest category, layers were considered "mixed" if more than 10% of its areal coverage was made up of an alternate vegetation type. The four entry choices for cover within each of the three vegetation layers were "0" (absent: zero cover), "1" (sparse: < 10%), "2" (moderate: 10 to 40%), "3" (heavy: 40 to 75%), and "4" (very heavy: > 75%) (Kaufmann et al. 1999).

The density of the overstory canopy was estimated and measured with a spherical densiometer. Measurements from a densitometer are objective and relatively precise. The densiometer uses a spherical-shaped reflector mirror engraved with a cross-shaped grid of 24 quarter inch squares. For each cross-section, densiometer measurements were taken separately in four directions positioned at the center of the stream and facing the upstream at the wetted channel margins of both banks. These measurements were used to calculate canopy cover over the channel and within the riparian corridor.

Large Woody Debris

The LWD methods for this study are a simplified adaptation of those described by Robison and Beschta (1990) which are used in the EMAP methods (Kaufmann et al. 1999). All LWD was categorized according to location in channel or bridging above bank full channel and then separated into size classes based on length and diameter using visual estimates.

LWD is defined as woody material with a diameter of at least 10 cm (4 inches), and length of at least 1.5 m (5 ft). At each cross section, the length and diameter of each piece of LWD identified within 15 feet, upstream and downstream (30 linear feet per cross section) were recorded. The diameter classes evaluated are as follows:

- 0.1 m to < 0.3 m,
- 0.3 m to < 0.6 m,
- 0.6 m to < 0.8 m, and > 0.8 m.

The length classes were defined as by Kaufmann et al 1999:

- 1.5m to < 5.0 m,

- 5 m to < 15 m,
- and > 15 m.

LWD smaller then 1.5m in length or 10cm in diameter at the large end were not recorded.

The number of pieces recorded in each reach was divided by the number of cross sections in each reach multiplied by 30-feet, the linear distance investigated at each cross section, to produce the number of pieces per linear feet. These values were used to compare the abundance of LWD between stream reaches, and to evaluate the abundance of LWD in each reach relative to "properly functioning" condition (NOAA 1996). NOAA Fisheries Service suggests that 50 pieces/km or .015 pieces/linear foot that are at least 0.6m wide by 15m long, as the reference value for properly functioning condition.

Bankfull Width and Depth

Bank morphology measurements are used to assess channel stability during flood flows, long-term channel down-cutting, and fish concealment features such as undercut banks. Bank angle and undercut distances were measured on the left and right banks at each cross section. Other parameters recorded include the wetted width of the channel, the width of exposed mid-channel gravel or sand bars, the estimated incision height, floodplain width, and the estimated width and depth of the channel at bankfull stage, and floodplain (Kaufmann et al 1999). Bank full width (BFW) is the width between these field indicators on each bank. Bank full depth (BFD) is the average depth of water at bank full stage.

Substrate

Substrate size and embeddedness were recorded at each of the cross-sections following the EMAP field methods (Kaufmann and Robison, 1994, 1998), to determine the extent of habitat present by assessing the amount of suitable spawning and rearing substrates present at each cross section. In the field, biologists measured the width of the channel from OHW, and sampled the channel at four equidistant points. Sediment data collected at some of the sample were outside of the wetted width of the stream channel. Field crews evaluated the size of substrate at each sample point according to the following size classes:

- RS Bedrock (Smooth) .... > 4000 mm
- RR Bedrock (Rough) ..... > 4000 mm
- HP Hardpan ..... > 4000 mm
- BL Boulders ..... > 250 to 4000 mm
- CB Cobbles ..... > 64 to 250 mm
- GC Gravel (Coarse)..... > 16 to 64 mm

- GF Gravel (Fine) ..... > 2 to 16 mm
- SA Sand ..... > 0.06 to 2 mm
- FN Silt, clay, muck ..... < 0.06 mm
- WD Wood ..... Regardless of Size
- OT Other ..... Regardless of Size

Embeddedness is described according to the portion of a particle's surface that is surrounded by (embedded in) fine sediments on the stream bottom. Sand and finer substrates are defined as 100% embedded (Kaufmann et al. 1999).

Quality Control

To ensure precise data were collected, field biologists reviewed the survey protocols prior to going to the field. The designer of the field survey also provided field staff with hands-on training in the field to provide biologists with the opportunity to become more familiar with the protocol.

To ensure that the data were accurately entered into Microsoft Excel spreadsheets, all data were entered and verified by at least two different data technicians. Data analysis was similarly inspected for accuracy.

2.1.2 Analysis

Summarized instream and riparian values for each stream reach were evaluated to determine whether the stream reach could potentially provide habitat for anadromous fish species. Data from each stream reach were analyzed and compared to published values representing natural conditions in the Pacific Northwest, or values that were determined to indicate properly functioning conditions for salmonid habitat by the National Marine Fisheries Service (NMFS) in their Matrix of Pathways and Indicators (matrix). Comparisons were also made between the three different stream reaches. Each stream reach was then evaluated to identify potential restoration opportunities.

NMFS developed a tool for evaluating and maintaining stable and healthy streams for anadromous salmonid populations (NOAA 1996). The NMFS matrix sets three condition levels for environmental parameters important to production and survival of anadromous fishes The three condition levels are: 1) properly functioning, 2) at risk, and 3) not properly functioning. The criteria for the environmental parameters at each condition level are described in the NMFS matrix (NOAA 1996).

2.2 Results

2.2.1 Description of each stream reach

Reach 1

Reach 1 is approximately 2,161 feet long and extends from where the stream mouth opens into the Strait of Georgia, upstream through a coastal lagoon and riparian ravine, to the fish barrier culvert at Henry Road. Driftwood has washed ashore and is accumulating as an extensive log jam at the stream mouth, possibly acting as a barrier to upstream fish passage. Just upstream of the log jam, the stream passes through a relatively undisturbed coastal lagoon. The tidally influenced coastal lagoon is characterized by emergent and salt marsh vegetation including fat-hen saltbush (*Atriplex patula)*, saltgrass (*Distichlis spicata)*, pickleweed (*Salicornica sp.)*, salt marsh dodder (*Cuscuta salina)*, arrowgrass (*Triglochin sp)*, and Pacific silverweed *(Argentina pacifica)*. Other species present include Sitka spruce (*Picea sitchensis)*, Douglas spirea (*Spiraea douglasii)*, and Nootka rose (*Rosa nutkana)*. The lagoon lies between the marine shoreline and an upland slope characterized by riparian communities. The lagoon appears to receive seasonal surface flow from the upland slopes and overflow from Stream 1 and another stream during periods of heavy rainfall. The lagoon also receives inputs of saltwater through the porous sediments of the beach and over the beach during severe storm events, but is not tidally influenced.

The majority of Reach 1 flows through a ravine, defined by steep slopes on both stream banks. The riparian corridor of Reach 1 is characterized by an alder canopy with a willow and twinberry shrub understory throughout. Wetland conditions are present between the Ordinary High Water (OHW) of the stream and the base of the ravine slope, and through several braided channels. The upper portions of the reach contain garbage from dumping via the access point at Henry Road. Portions of the stream are braided throughout this reach. Reach 1 is the only documented fish-bearing reach on Stream 1.

Reach 2

Reach 2 is approximately 2,742 ft and extends from Henry Road to Lonseth Road. Similar to Reach 1, in Reach 2 the stream flows through a steep ravine. Unlike Reach 1, wetland conditions are not present throughout, and the streambed is generally much narrower with less emergent or aquatic vegetation. The riparian community is characterized by an alder canopy with shrubs including salmonberry (*Rubus spectabilis)* and snowberry (*Symphoricarpos* albus) in the understory.

Reach 3

The area of Reach 3 investigated during this study extends approximately 761 feet upstream of Lonseth Road through a heavily forested portion of the site. Stream 1 extends approximately 1,400 feet upstream from the area investigated, with its headwaters loosely channelized in the northeast portion of the project site.

In this uppermost reach, the stream is not in a ravine, and is relatively shallow. This section of the stream flows through an open field.

2.2.2 Riparian Vegetation

The riparian corridor of all three reaches of Stream 1 is composed primarily of deciduous forests, with an average canopy cover over all three reaches between 10-40 percent (Table 4). Blackberry (*Rubus discolor*) was present in all riparian stream reaches, with some areas dominated by the invasive. Very little of the overstory vegetation is coniferous. Of the three reaches, reach two had a slightly more dense canopy than the other two reaches, with several cross sections characterized by 70 to 100 percent canopy cover.

Reach 1

Canopy cover in Reach 1 is composed of both deciduous and mixed canopy cover with a low average percent canopy cover. On average, the canopy cover was lower than that in Reach 2, but higher than the average canopy cover present in Reach 3. While a significant understory cover was present, 40-75% woody shrubs and saplings on average, Reach 1 has the most sparse understory of all three reaches. The highest average percentage of ground covered by bare dirt was also present in Reach 1.

Reach 2

Canopy cover in Reach 2, as in Reach 1, was composed of both deciduous and mixed canopy cover. While deciduous canopy cover was low, similar to the other reaches, mixed canopy cover was highest in Reach 2 –in the range of 10-40% on average. Overall, Reach 2 had the highest canopy cover. Reach 2 had a thicker understory then Reach 1, but the understory for Reach 2 was not as thick as in Reach 3, with woody shrubs and sapling averaging in the range of 40-75% and non-woody herbs, grasses and forbes averaging in the range of 10-40%.

Reach 3

Reach 3 had the lowest canopy cover on average of the three reaches with no mixed canopy cover present. The thickest average understory cover of all three reaches are present in Reach 3, woody shrubs and saplings greater than 75% and non-woody herbs, grasses, and forbes in the range of 10-40%.

Table 3 Riparian cover on Stream 1

	Canopy Cover		Understory Cover		Ground Cover		
Reach	Deciduous	Mixed	Woody shrubs/saplings	non-woody herbs, grasses, forbes	woody shrubs	non woody	bare dirt
1	<10%	10-40%	40-75%	<10%	<10%	10-40%	10-40%
2	<10%	10-40%	40-75%	10-40%	<10%	10-40%	<10%
3	<10%	10-40%	>75%	10-40%	<10%	10-40%	<10%

2.2.3 Large Woody Debris

LWD per linear foot of stream declined from upstream to downstream. Stream Reach 3 had the highest abundance of LWD and stream Reach 1 had the lowest abundance. All three reaches contained more than 0.046 pieces per linear foot, the frequency of LWD that NMFS considers properly functioning (Table 4).

The Washington Forest Practices Board's *Manual for Conducting Watershed Analysis (*WFPB 1997) suggested that a stream channel must contain a few larger pieces of wood that provide stability and function in unison with smaller pieces. These pieces of LWD have been termed "key pieces" by WFPB and NMFS. The Salmonid Stream Habitat Restoration Manual, Third Edition (Flosi et al. 2004) defines key pieces by the following minimum size requirements for LWD in unanchored applications: logs with a minimum diameter of twelve inches and a minimum length 1.5 times the mean bankfull width of the stream channel type reach and the deployment site.

All three stream reaches contained the recommended amount of LWD, and key pieces of LWD per linear foot.

Table 4 LWD frequency in Stream 1

Reach	# LWD/Linear foot	# Key pieces/Linear foot
Reference	*.046*[1]	*0.015*
1	0.21	0.19
2	0.22	0.14
3	0.08	0.06

1 Several studies have found the low end of the range of LWD abundance in natural conditions to be 150 pieces/km or .046 pieces/foot (Murphy and Koski 1989, Ralph et al. 1994, Beechie and Sibley 1997).

2.2.4 Channel Morphology

The bankfull width to depth ratios for all three reaches were below the 10:1 NMFS threshold for "properly functioning condition" (NOAA 1996). The average width to depth ratios in Stream 1 were 2:1 for Reach 1, 2:1 for Reach 2, and 4:1 for Reach 3 (Table 6). The width of the floodplain relative to stream depth was also measured for all three reaches for future use. The width of the floodplain relative to stream depth for reach 1 is 18:1, reach 2 is 15:1, and reach 3 is 21:1.

Table 5 Bankfull width to depth ratios (BFW:BFD) for Stream 1

Reach	Average Floodplain width (feet)	Average BFW (inches)	Average BFD (inches)	BFW:BFD
Reference				*10:1*[1]
1	77	76	51	2:1
2	38	64	33	2:1
3	36	76	21	4:1

1 The NMFS matrix categorizes streams with a bankfull width/depth ratio of less than 10:1 as "properly functioning" (NOAA 1996).

2.2.5 Sediment Quality

The substrate compositions of all three reaches of Stream 1 are considered "not properly functioning" habitat elements. Fines were the dominant substrate size class within the three reaches of Stream 1 (Figure 1). The next most abundant substrate was sand in all three reaches. Reaches 1 and 2 had the greatest diversity of substrates containing fines, sand, fine gravel and course gravel. All three reaches were dominated by substrates composed of fines with sand being the next most abundant substrate. Reach 1 was composed of 74% fines and 17% sand on average. Within Stream Reach 2, fines accounted for an average 62% of the substrate composition, while sand accounted for an average 22%. Reach three was composed entirely of fines and sand, averaging 70% and 30% respectively.

Reach 1

All four substrate types- fines, sand, fine gravel, and coarse gravel- were present in Reach 1 on average. Of the three reaches, Reach 1 has the highest average percentage of fines. While Reach 1 ranked second among the three reaches for average combined fines and sand percentage, and average combined fine and course gravel percentage, it had the highest average percentage of course gravel.

Reach 2

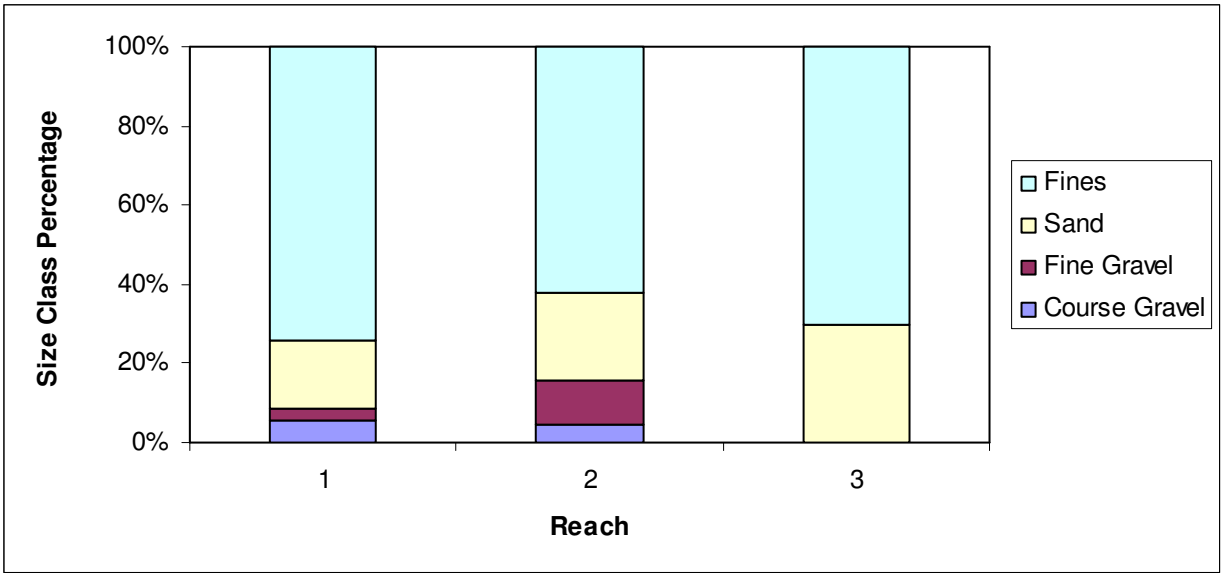
As in Reach 1, on average all four substrate types were present in Reach 2 on average. Of the three reaches, Reach 2 had the lowest average percentage of fines and of

combined fines and sand substrate. Reach 2 had the highest average combined fine and course gravel substrate percentage.

Reach 3

Average substrates in Reach 3 were composed entirely of fines and sand. Reach 3 is the only reach with no gravel present on average.

Figure 5 Comparison of substrate size class percentage between Stream 1 reaches



Note: NMFS matrix suggest that streams are "properly functioning" if the dominant substrate is gravel or cobble. An area is considered "not properly functioning" if bedrock, sand, silt or small gravel are the dominant substrate (NOAA 1996).

2.3 Discussion

2.3.1 Riparian Corridor

The riparian corridor throughout Stream 1 is composed of a deciduous overstory, with sparse coniferous vegetation. The deciduous overstory is dominated by young, relatively small diameter species including western hemlock (*Tsuga heterophylla*), bigleaf maple (*Acer macrophyllum*), cottonwood (*Populus trichocarpa*), and alder (*Alnus rubra*). Canopy cover is along Stream 1 is almost continuous along the entire length of the stream. Disruption of the canopy cover is limited to the roads that cross Stream 1 between Reach 1 and 2, and between Reach 2 and 3. Surveys of canopy cover were conducted in the fall after leaves had fallen from trees, so estimates and calculated canopy covers may be lower than summer values.

The low density of conifers in the study area is likely the result of historical logging in the area. Preservation of vegetation in the study area will result in a natural succession of coniferous vegetation replacing the current alder dominated communities. Both visual and calculated estimates of canopy cover are below the reference value of greater than

80 percent intact canopy cover to provide stream shading, aquatic insect recruitment, and an adequate source of LWD.

All three reaches have overstory canopies that provide 10-40% cover with a continuous alder canopy and a substantial understory. Reach 1 and Reach 2 are similar in that they contain a thick deciduous overstory with some coniferous overstory present and a substantial understory. Reach 3 has a continuous alder canopy cover and very thick understory present, but lacks a coniferous overstory, and the overstory was somewhat sparse. Alder dominates the understory in this reach. It appears that the area may become "properly functioning" once the alder understory grows and as natural succession occurs and conifer presence increases in the area.

2.3.2 Channel Morphology

Stream channel morphology is influenced by overland and channel flow, drainage systems and channel networks, stream discharge and basin area, and stream erosion. The condition of stream morphology is evaluated as the bankfull width relative to the bankfull depth. It is generally accepted that properly functioning condition for stream channel morphology is a BFW:BFD of under 10Large Woody Debris

LWD provides many functions, such as dissipating energy flow, protecting stream banks, stabilizing stream beds, storing sediment, and providing instream cover and habitat diversity (Keller and Swanson, 1979, Bilby 1984, Harmon et al. 1986, Bisson et al. 1987, Gregory et al. 1991). According to NMFS, properly functioning condition is described as more than 50 pieces of LWD per kilometer that are greater than 24-inches in diameter and greater than 50-feet long. Other studies describe normal LWD frequencies in natural streams in the PNW as 150 to 670 pieces/km (Ralph et al. 1994, Murphy and Koski 1989) Based on published standards for LWD per a given stream reach it is apparent that the stream reaches within the study area have sufficient LWD.

2.3.3 Sediment Quality

Salmon require gravel and cobble dominated sediments for spawning and rearing. An abundance of fines and sand can suffocate salmon embryos. Fines are the dominant substrate in all three reaches. According to the NMFS matrix, sand, silt, or small gravel dominant substrates are considered "not properly functioning." Substrate that is excessively fine is the result of excessively unstable in-channel habitat which can be caused by human impacts. Excessive watershed erosion from these activities can transport large amounts of fine sediments into streams, leading to poor instream habitat (Kaufmann et al. 1999).

Excessive erosion does not appear to be occurring in Stream 1, as the stream banks are not incised and excessive scouring of the stream channel was not observed. The abundance of fines and sand present in all three reaches is most likely due to low flow volumes and velocities in the stream, rather then the result of excessive erosion in the watershed. Low stream flow limits the stream's ability to carry sediment, which prevents sediment transport in the stream. This results in increased fine sediment throughout the stream.

Reach 3, near the headwaters, had entirely fines and sand substrate. This area is most likely characterized by the lowest flows due to smaller amounts of water at the headwaters of the stream and a wide BFW and shallow BFD. As more water drains into the stream from tributaries and ditches, the water flow increases. In Reach 2 this allows some of the fines and sand to be flushed out of the substrate and the amount of gravel visible in the substrate increases. The amount of fines and sand increases slightly in Reach 3 with a decrease in flow as the stream spreads out and drains to the Strait of Georgia.

2.3.4 Matrix of Pathways and Indicators

When compared with the three condition levels of the NMFS matrix, most of the environmental parameters of Stream 1 are "not properly functioning" (see Table 7 for NMFS matrix evaluations of Stream 1). Riparian reserves are the only parameter considered "properly functioning" for Stream 1. Many parameters are considered "not properly functioning" including: physical barriers, LWD abundance, and bankfull width to depth ratios. The matrix below reflects the conditions of the overall stream when compared with reference data. However, as noted previously, reference data does not account for characteristics of Stream 1 caused by natural condition rather then degradation of the watershed. A high bankfull width to depth ratio may be one of these characteristics.

Table 6 NMFS Matrix of Pathways and Indicators evaluated for Stream 1

Pathway	Indicator	Properly Functioning	At Risk	Not Properly Functioning
Habitat Access	Physical Barriers			X
Habitat Elements	Substrate			X
Habitat Elements	Large Woody Debris	X		
Channel Condition and Dynamics	Width/Depth Ratio	X		
Watershed Conditions	Riparian Reserves			X

2.4 Restoration and Conclusions

Relative to the NMFS definition of properly functioning condition, stream 1 is properly functioning, with exception to substrate and physical barriers. The results of this habitat evaluation provide data to determine where and how to restore habitat in Stream 1, as well as how to increase the range and abundance of quality salmonid spawning and rearing habitat. Restoration opportunities along Stream 1 include replacement of culverts to permit fish passage further upstream, reroute ditches in site to flow into Stream 1 in order to increase water flow, preservation of the riparian area and buffer to allow for natural succession of vegetation, and possibly installation of habitat gravel.

Reach 1

During the survey it was noted that a large amount of LDW has naturally collected at the mouth of Stream 1, along the shoreline of the site, and might be acting as a barrier to fish passage upstream. Preservation of the area including the riparian buffer will provide shade, maintain lower water temperatures, and attract prey species. Additionally, preservation of the area will allow for the alder dominated riparian vegetation to be replaced by conifers as natural succession of the plant community occurs. As previously mentioned, conifers provide increased habitat functionality. Rerouting the ditches on site to flow into Stream 1 could substantially enhance fish habitat in Reach 1 by deepening the stream channel and providing heavier year round flows. The floodplain of Reach 1 is wide and appears to have the capacity to support additional flow.

Reach 2

As with Reach 1, preservation of the riparian area and buffer, rerouting on site ditches to increase flows through the stream will enhance fish habitat in Reach 2 for the reasons mentioned above. The most beneficial restoration action for Reach 2 is replacement of the culvert running between Reach 1 and 2 with a structure that allows for fish passage. Reach 2 is the most functioning fish habitat in Stream 1, but it is inaccessible to fish because of the culvert.

Reach 3

Replacement of the culvert between Reach 2 and Reach 3 with a structure that allows fish passage will also be beneficial to Reach 3 and increase flows through re-routing roadside ditches to the main channel would provide habitat improvements. To provide spawning habitat, Reach 3 may require the installation of habitat gravel. Average substrate cross sections in Reach 3 were composed entirely of fines and sand which are not suitable substrates for salmonid spawning and rearing.

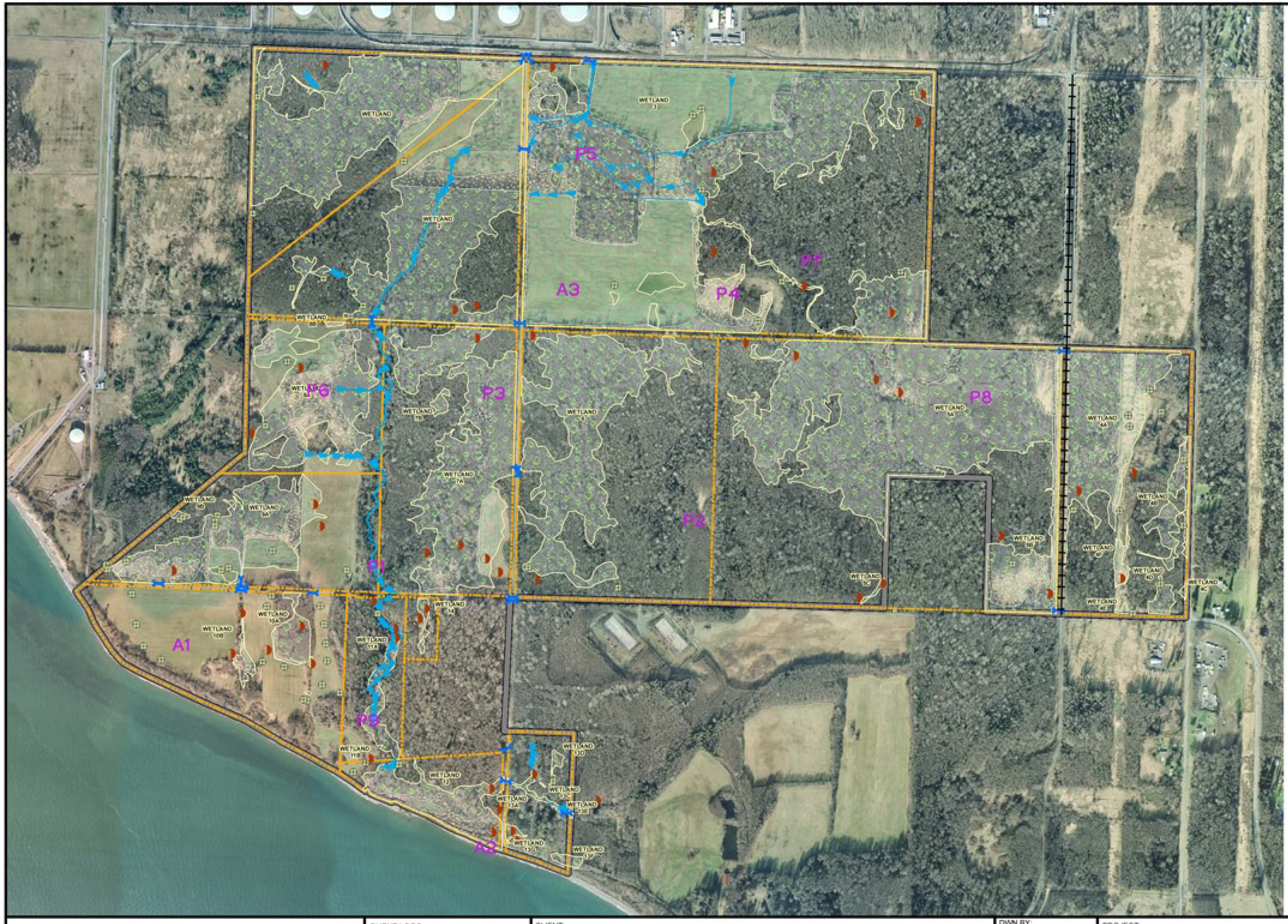
Preservation of the riparian area and buffer in Reach 3 will allow the relatively sparse canopy to develop and, as with the other reaches, will also allow for the alder dominated riparian vegetation to be replaced by conifers as natural succession occurs

3.0 BIRD SURVEYS

Bird surveys were conducted to determine the presence of birds at the GPT site, to assess the potential impacts of the proposed development on birds using the site, and to ensure compliance with all applicable laws, including the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), and local regulations. Birds were surveyed in both terrestrial and marine habitats.

3.1 Study Area

The study area encompassed the entire GPT property, which consists of approximately 1,092 acres of undeveloped land bounded by roads and industrial operations to the north, east, and south, and by the Strait of Georgia to the southwest. A mosaic of forest, shrub, meadow, and riparian communities covers the site, including approximately 500



LEGEND

- SURVEYED DATA POINT
- APPROXIMATE DATA POINT
- CULVERT
- RAILROAD
- DRAINAGE
- STUDY AREA BOUNDARY
- FRESHWATER FORESTED WETLAND (PFO)
- FRESHWATER SHRUB WETLAND (PSS)
- FRESHWATER EMERGENT WETLAND (PEM)
- ASSESMENT UNIT

Bird Surveys

P Point station

A Area Count

Forested Wetland: P3, P5, P8

Forested Upland: P2, P7

Scrub-shrub Wetland: P4, P7

Scrub-shrub Upland: various others

Pasture: A1

Wet Meadow: A3

Riparian: P1, P9

Marine: A2

0 500 1,000 1,500 Feet

CLIENT LOGO

CLIENT: PACIFIC INTERNATIONAL TERMINALS

AMEC Earth & Environmental
7376 SW Durham Road
Portland, OR, U.S.A. 97224

DWN BY: PM
CHK'D BY: MG
DATUM: NAD83
PROJECTION: WA SP North, Ft.
SCALE: 1 inch equals 1,000 feet

PROJECT: GATEWAY PACIFIC TERMINAL
STREAM AND BIRD SURVEYS
BASELINE INVESTIGATION

TITLE: BIRD SURVEY STATIONS

DATE: SEPTEMBER 2009
PROJECT NO.: 5-91M-15338-0
REV. NO.: 1
FIGURE NO.: FIGURE 6

K:\AMEC US OFFICES\KIRKLAND\15338-0\DWG\ArcView\Cherry_Point_Overview_Map_11x17.mxd

acres of wetland (AMEC 2008). Remnants of past agricultural land use are present in some areas, including abandoned fields, pastures, and homesites.

3.1.1 Habitat at the GPT Site

3.1.1.1 FOREST

Vegetation in forested areas consists primarily of a deciduous forest canopy dominated by red alder (*Alnus rubra*) and black cottonwood (*Populus balsamifera*) with scattered western red cedar (*Thuja plicata*) and Douglas-fir (*Pseudotsuga menziesii*) trees. Forests consist of multiple age classes, with the oldest and largest trees found near riparian corridors.

The shrub layer consists of vine maple (*Acer circinatum*), common snowberry (*Symphoricarpos alba*), salmonberry (*Rubus spectablilis*), Indian plum (*Oemlaria cerasiformes*) clustered rose (*Rosa pisocarpa*), and red elderberry (*Sambucus racemosa*), with red-osier dogwood (*Cornus sericea*), willows (*Salix* spp), and twinberry (*Lonicera involucrate*) in forested wetlands. The herbaceous layer is dominated by sword fern (*Polystichum munitum*), bracken fern (*Pteridium aquilinum*), and Pacific blackberry (*Rubus ursinus*), with piggy-back plant (*Tolmeii menziesii*), soft rush, and slough sedge in forested wetlands.

3.1.1.2 SCRUB-SHRUB

Dense thickets of Nootka rose and Himalayan blackberry (*Rubus armeniacus*) are common along forest and road edges. Patches of scrub-shrub wetlands are present throughout the study area, and are commonly dominated by Nootka rose, Douglas spirea (*Spirea douglasii*), and Himalayan blackberry.

3.1.1.3 HERBACEOUS VEGETATION

Vegetation in upland meadows that are occasionally seeded and hayed annually consists of thick grasses including red fescue (*Festuca rubra*), bentgrass (*Agrostis* spp), sweet vernalgrass (*Anthoxanthum odoratum*), common velvetgrass (*Holcus lantatum*), and English plantain (*Plantago lanceolata*). In less extensively managed pastures, dominant grass species include red fescue, meadow foxtail (*Alopecurus pretensis*), Canadian thistle (*Cirsium vulgaris*), bentgrass, quackgrass (*Agropyron repens*), and orchard grass (*Dactylis glomerata*)1.

Wet meadows are dominated by a mixture of non-native pasture grasses including bentgrass, meadow foxtail, and sweet vernalgrass. Extensive stands of reed canarygrass (*Phalaris arundinaceae*) are present in some areas. Pastures are bounded by forest and/or road edges with tall trees and dense shrubs.

3.1.1.4 MARINE AND NEARSHORE

The southwestern portion of the study area lies on the shore of Birch Bay in the Strait of Georgia. The majority of the shoreline in the study area is undeveloped, and consists of

a cobbly substrate, which becomes sandy at higher elevations. Dune grasses, large woody debris, and patches of shrubs line the upper shoreline. Tall coniferous and deciduous trees overhang the steep bluffs that separate the shoreline from the rest of the site. Open water within the study area is primarily undeveloped, with some remnant pilings from a dilapidated pier.

3.2 Methods

Avian presence at the GPT site was evaluated using the point count method as outlined in the *U.S. EPA Methods for Evaluating Wetland Condition: Biological Assessment Methods for Birds.* (U.S. EPA 2002). Two two-day point counts were conducted during the breeding season on January 13 and 14 and February 26 and 27 2009, and two two-day point counts were conducted during the breeding season on April 21 and 22 and May 21 and 22, 2009.

Point counts were conducted by qualified AMEC biologists, at permanent point count stations that were selected to be representative of vegetation communities throughout the site. Point counts were conducted for a duration of 10 minutes at each station between 7:00 a.m. and 12:00 p.m. when birds are most active. All birds seen or heard from the center of the plot were recorded during the 10-minute counts. Birds seen or heard between point count stations were noted, but not included in point count tallies.

3.2.1 Background Review

Prior to conducting the field survey, AMEC biologists reviewed available information regarding terrestrial wildlife on the GPT site, including aerial photography and past site investigations. AMEC also consulted federal, state, and local resources to determine the presence of likely presence of sensitive wildlife and habitats that may use the GPT site.

Information from the Washington Department of Fish and Wildlife's (WDFW) Priority Habitat and Species (PHS) database was obtained to identify rare, endangered, or priority species and/or habitats that known to be present at the site. Most of the shoreline within the boundary of the study area is mapped by WDFW as Urban Natural Open Space. This area contains large trees used for perching and foraging by bald eagles (*Haliaeetus Leucocephalus*) and peregrine falcons (*Falco peregrinus*). This area is also mapped as active and productive eagle territory, and foraging habitat for peregrine falcons. A small colony of nesting pigeon guillemots (*Cepphus columba*) is mapped along the shore in the central portion of the site.

Other Priority Species listed by the WDFW as having the potential to be present in Whatcom County on or in the vicinity of the study area were noted and searched for during field surveys.

3.2.2 Point Count Station Characteristics

A total of 12 permanent point count stations were established in the study area. Station locations were selected to be representative of habitats present throughout the site. Station locations were selected prior to the field surveys using aerial imagery and habitat

descriptions from previous field studies. The location of point count stations were located on the ground during the first field survey, and re-located during subsequent surveys using a GPS unit.

Survey stations included marine shoreline, riparian, and terrestrial habitats, and were located in areas representative of habitats present on the site (Figure 6, Table 7). Hawks and other birds of prey that are typically be seen flying overhead were sampled in meadow habitats.

Table 7 Habitats encompassed by each Point Count Station.

Point Count Station	Habitat
A1	• Upland Meadow
A2	• Marine Shoreline / Open Water
A3	• Wet Meadow
P1	• Forested Upland - mature riparian
P2	• Forested Upland - mature
P3	• Forested Wetland - young
P5	• Scrub-shrub Wetland
P6	• Scrub-shrub Wetland
P7	• Forested Upland - mature
P8	• Forested Wetland - young
P9	• Forested Wetland - young
P10	• Forested Upland - mature/riparian

3.3 Results

A total of 616 birds representing 63 species were detected during point counts (Table 8). Of these, 249 birds (29 species) were detected during the non-breeding season, and 367 birds (55 species) were detected during the breeding season.

Birds detected at the site consisted of year-round resident species, seasonal migrants, and migrating birds using the site as a stopover area. American robins were the most abundant species detected during the non-breeding season, followed by song sparrows, black-capped chickadees, and winter wrens. Song sparrows were the most abundant

Figure 6 Bird Survey Stations

species detected during the breeding season, followed by American goldfinches, American robins, and savannah sparrows. Species detected most often during the surveys are habitat generalists adapted to a variety of environments, except for.winter wrens, which are found almost exclusively in forested environments, and savannah sparrows, which are seasonal migrants associated with open habitats.

The number of individual birds detected for some year-round resident species such as American goldfinches and white-crowned sparrows was higher during the breeding season than during the non-breeding season (Table 8). This is likely the result of either an increased abundance of birds during the breeding season where suitable breeding habitat exists, or higher rates of detection due to increased bird vocalizations associated with breeding. Other year-round resident species such as Anna's hummingbirds were only present on the site during the breeding season in the spring, after food sources such as salmonberry had become available.

3.3.1 Migratory Birds

Yellow warblers, Wilson's warblers, and common yellowthroats were observed throughout the study area during the breeding season, and were presumably breeding on the site. Yellow warblers and Wilson's warblers were most often detected in forest and scrub-shrub vegetation communities, in both wetlands and uplands. Common yellowthroats were most often detected in scrub-shrub wetland communities. Other seasonal migrants that appeared to be breeding on the site included violet-green swallows, barn swallows, and rufous hummingbirds, which were detected foraging in the air throughout scrub-shrub and herbaceous uplands and wetlands.

The Blair Waterway and adjacent areas provide wintering habitat for a variety of waterfowl and gulls. Barrow's goldeneyes, horned grebes, common mergansers, and common loons were observed utilizing the Blair Waterway for foraging during the non-breeding season. Other species observed within the Blair Waterway included gulls, crows, Caspian terns (assumed to be in migration), and Canada geese, which bred along the eastern shore.

Table 8 Birds detected during point count surveys.

		Start Date of Survey				
Common name	**Scientific name**	**1/13/2009**	**2/26/2009**	**4/21/2009**	**5/21/2009**	**Migratory status[1]**
American crow	*Corvus brachyrhynchos*		3	6	2	YR
American goldfinch	*Carduelis tristis*	2	1	18	20	YR
American robin	*Turdus migratorius*	5	29	17	18	YR
Anna's hummingbird	*Calypte anna*			1	4	YR
bald eagle	*Haliaeetus leucocephalus*	2	1	2		YR
barn swallow	*Hirundo rustica*				5	B
Barrow's goldeneye	*Bucephala islandica*	5		1		NB
Bewick's wren	*Thryothorus ludovicianus*	4	6	13	2	YR
black-capped chickadee	*Poecile rufescens*	6	20	8	8	YR
black-headed grosbeak	*Pheucticus melanocephalus*				5	B
brown creeper	*Certhia americana*		1	1	2	YR
brown-headed cowbird	*Molothrus ater*			2	5	B
bushtit	*Psaltriparus minimus*	50				YR
chestnut-backed chickadee	*Poecile rufescens*	8	4	7	7	YR
common goldeneye	*Bucephala clangula*		5			NB
common loon	*Gavia immer*			1		NB
common yellowthroat	*Geothlypis trichas*			9	7	B
Cooper's hawk	*Accipiter cooperii*	1				YR
Cormorant species	*Phalacrocorax spp.*			2		N
dark-eyed junco	*Junco hyemalis*	2	5	2	7	YR

golden-crowned kinglet	*Regulus satrapa*	1	4			YR
golden-crowned sparrow	*Zonotrichia atricapilla*			4		NB
great blue heron	*Ardea herodias*				1	YR
hairy woodpecker	*Picoides villosus*				1	YR
harlequin duck	*Histrionicus histrionicus*			7		B
herring gull	*Larus argentatus*			1		NB
horned grebe	*Podiceps auritus*	3	0	3	0	NB
Hutton's vireo	*Vireo huttoni*				1	YR
loon species	*Gavia spp.*		1			N
marsh wren	*Cistothorus palustris*		1	0	1	YR
merlin	*Falco columbarius*	1				YR
mourning dove	*Zenaida macroura*			1	2	YR
northern flicker	*Colaptes auratus*	1		1	1	YR
northern harrier	*Circus cyaneus*	1				YR
olive-sided flycatcher	*Contopus cooperi*				3	B
orange-crowned warbler	*Vermivora celata*			1		B
Pacific-slope flycatcher	*Empidonax difficilis*				8	B
pelagic cormorant	*Phalacrocorax pelagicus*				1	YR
pileated woodpecker	Dryocopus pileatus			1		YR
pine siskin	*Carduelis pinus*		5	1	2	YR
red-breasted merganser	*Mergus serrator*			7		M
red-tailed hawk	*Buteo jamaicensis*		1	1		YR
red-winged blackbird	*Agelaius phoeniceus*			1	2	YR
ruby-crowned kinglet	*Regulus calendula*	4		1	1	NB

rufous hummingbird	*Selasphorus rufus*			5	1	B
savannah sparrow	*Passerculus sandwichensis*			9	10	B
song sparrow	*Melospiza melodia*	8	18	15	24	YR
spotted towhee	*Pipilo maculatus*	2	7	10	3	YR
surf scoter	*Melanitta perspicillata*			1		NB
Swainson's thrush	*Catharus ustulatus*				1	B
unidentified gull	*Laridae family*	9	3			N
warbling vireo	*Vireo gilvus*				1	B
western grebe	*Aechmophorus occidentalis*		1			NB
western gull	*Larus occidentalis*			2	4	YR
western tanager	*Piranga ludoviciana*				1	B
white-crowned sparrow	*Zonotrichia leucophrys*			3		YR
willow flycatcher	*Empidonax traillii*				1	B
Wilson's warbler	*Wilsonia pusilla*			1	3	B
winter wren	*Troglodytes troglodytes*	11	7	8	5	YR
woodpecker species	*Picoides spp.*				1	N
yellow warbler	*Dendroica petechia*			1	8	B
yellow-rumped warbler	*Dendroica coronata*		3	8	5	B

1 B Occurs during the breeding season in Puget Sound Lowlands
NB Occurs during the non-breeding season in Puget Sound Lowlands
M Occurs during migration in Puget Sound Lowlands
YR Occurs year-round in Puget Sound Lowlands
N Cannot be determined
(*Definitions and species status from Seattle Audubon Society 2008*)

3.4 Threatened and Endangered Species

According the WDFW PHS database, 25 Priority Species and several types of concentration of waterfowl are listed as having the potential to be present on or in the vicinity of the GPT site. Priority species that could be present on the site are listed in Table 9..

Seven species on the PHS list were detected during field surveys including common loon, western grebe, harlequin duck, bald eagle, merlin, and pileated woodpecker (Table 9). Priority areas exist for five of the seven species. Bald eagles were regularly observed roosting in large trees along the bluff in the southern portion of the site, which would be considered a priority area. Other priority areas within the GPT site include nearshore habitat, which provides habitat for regular concentrations of common loons, western grebes, and harlequin ducks, and a migratory stopover area for loons and grebes.

Suitable breeding habitat exists within the site for Pileated woodpeckers, which depend on large trees for cavity nesting. As such, priority areas for Pileated woodpeckers is considered to be present on the site. Birds were detected during three of the four point counts, and are assumed to be breeding on the site. The site does not contain breeding habitat for merlin due to a lack of coniferous forest, and no heron rookeries were observed; therefore priority areas for these species is not considered to be present.

Table 9 WDFW Priority Species that may be present on site

Common Name	Scientific Name	Priority Area (s)	State Status	Federal Status
Brandt's cormorant	*Phalacrocorax penicillatus*	B, C	Candidate	None
Common loon[1]	*Gavia immer*	B, C, M	Sensitive	None
Common murre	*Uria aalge*	B, C	Candidate	None
Marbeled murrelet	*Brachyramphus marmoratus*	A	Threatened	Threatened
Short-tailed albatross	*Phoebastria albatrus*	A	Candidate	Endangered
Western grebe[1]	*Aechmophorus occidentalis*	B, C, M, W	Candidate`	None
Great Blue Heron[1]	*Ardea herodias*	B	None	None
Brandt	*Branta bernicla*	C, M	None	None
Harlequin duck[1]	*Histrionicus hitrionicus*	B, C	None	None
Snow goose	*Chen caerulescens*	C	None	None
Trumpeter swan	*Cygnus buccinator*	C	None	None
Tundra swan	*Cygnus columbianus*	C	None	None
Bald eagle[1]	*Haliaeetus leucocephalus*	B, C, R	Sensitive	Species of Concern
Golden eagle	*Aquila chrysaetos*	B, F	Candidate	None
Merlin[1]	*Falco columbarius*	B	Candidate	None

Northern goshawk	*Accipiter gentilis*	B	Candidate	Species of Concern
Peregrine falcon	*Falco peregrinus*	B, O	Sensitive	Species of Concern
Blue grouse	*Dendragapus fuliginosus*	B, O	None	None
Band-tailed pigeon	*Columba fasciata*	C, S	None	None
Yellow-billed cuckoo	*Coccyzus americanus*	A	Candidate	Candidate
Spotted owl	*Strix occidentalis*	A	Endangered	Threatened
Vaux's swift	*Chaetura vauxi*	B, R	Candidate	None
Black-backed woodpecker	*Picoides articus*	B, O	Candidate	None
Pileated woodpecker[1]	*Dryocopus pileatus*	B	Candidate	None
Purple martin	*Progne subis*	B, F	Candidate	None
Nonbreeding concentrations of shorebirds Charadriidae, Scolopacidae, Phalaropodidae				
Nonbreeding concentrations of Barrow's goldeneye (*Bucephala islandica*), Common goldeneye (*Bucephala clangula*), and Bufflehead (*Bucephala albeola*).				
Waterfowl concentrations including breeding areas and regular concentrations in winter.				
Breeding areas for cavity-nesting ducks.				
Breeding concentrations of Cormorants (Phalacrocoracidae), Storm-petrels (Hydrobatidae), Terns (Laridae), and Alcids (Alcidae)				
Nonbreeding concentrations of Loons (Gaviidae), Grebes (Podicipedidae), Cormorants (Phalacrocoracidae), Fulmar (Procellariidae), Shearwaters (Procellariidae), Storm-petrels (Hydrobatidae), Alcids (Alcidae)				

Source: WDFW 2008

Notes

[1] Species detected during field investigations

Priority Area:

A = Any
B = Breeding areas
C = Regular concentrations
F = Foraging areas
M = Migratory stopover
O = Regular occurrences
R = Communal roosts
S = Occupied mineral sites
W = Regular occurrences in winter

4.0 REGULATORY CONSIDERATIONS

4.1 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-712 § 703) established federal responsibility for the protection of nearly all species of migratory birds, their eggs, and nests. A migratory bird is any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle.

Under the MBTA, it is illegal for people to “take” migratory birds, their eggs, feathers, or nests. The MBTA defines “take” to include any attempt at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof. More than 800 species are currently protected under the MBTA. Protection of nests by the MBTA includes only nests with eggs and/or young (USFWS 2008).

Fifteen species of migratory birds were detected during avian surveys (see Section 3.1). Of those, seven species are assumed to be using the site for breeding.

4.2 Endangered Species Act

The Endangered Species Act (ESA) of 1973 (7 U.S.C. §136; 16 U.S.C. §460 et seq.). was designed to protect critically imperiled species from extinction as a consequence of economic growth and development. The ESA provides a program for the conservation of plants and animals listed as threatened, endangered, or candidates for listing. The law requires federal agencies, in consultation with the U.S. Fish and Wildlife Service and/or the U.S. National Oceanic and Atmospheric Administration Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species, or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes a "taking" of any listed species of endangered fish or wildlife.

No species listed under the ESA were detected within the study area.

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